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धागा — विशिष्टि
(दूसरा पुनरीक्षण)

**Textiles — Spun Hemp Yarn —
Specification**
(Second Revision)

ICS 59.080.20

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Price Group 5

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards after the draft was finalized by the Cordage Sectional Committee and approved by the Textiles Division Council.

Hemp is a strong, inelastic yarn that's great for market bags and home accessories like placemats and coasters. It's also great for other accessories like rope, bags, lace headbands, and bead projects. When blended with cotton it makes great dishcloths.

This Indian Standard was first published in 1972 and subsequently revised in 1987. This revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

- a) Requirement for identification of material has been incorporated;
- b) Marking clause has been modified; and
- c) References to Indian standards have been updated.

This standard is based on IND/TC 2452 'Spun yarn, hemp, white or tarred,' issued by the Ministry of Defence, Government of India.

The composition of the committee responsible for the formulation of this standard is listed in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***TEXTILES — SPUN HEMP YARN — SPECIFICATION***(Second Revision)***1 SCOPE**

1.1 This standard prescribes the requirements of 5 varieties of spun hemp yarn, tarred or untarred.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed in Annex A.

3 CONDITIONING OF TEST SPECIMENS AND ATMOSPHERIC CONDITIONS FOR TESTING

3.1 Conditioning of Test Specimens- Prior to test, the test specimens shall be conditioned to moisture equilibrium in a standard atmosphere at (65 ± 2) percent relative humidity and (27 ± 2) °C temperature (*see also* IS 6359), unless otherwise provided for in an agreement between the buyer and the seller.

3.1.1 When the test specimens have been left in the standard atmosphere for 24 h in such a way as to expose, as far as possible, all portions of the specimens to the atmosphere, they shall be deemed to have reached moisture equilibrium.

3.2 All tests shall be carried out in the standard atmospheric conditions (*see 3.1*), unless otherwise provided for in an agreement between the buyer and the seller.

4 MANUFACTURE**4.1 Hemp Fibre**

The fibre used in the manufacture of yarn should be hemp (*Cannabis sativa* or *Crotolaria juncea*), unadulterated and free from defects and shorts. It should be well-hackled.

4.2 Yarn

The hemp yarn should be evenly spun. The direction of twist in the single yarn shall be 'Z' and that in the plied yarn shall be 'S'. All plied yarn shall be made from single yarn of the same count that is approximately 5.56 ktex.

4.3 Skein

Each skein should be continuous throughout its length and should not contain any loose ends.

5 REQUIREMENTS**5.1 Fibre Identification**

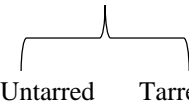
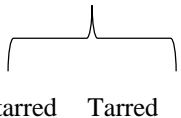
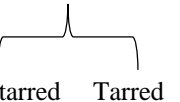
The material of yarn made from hemp fibre shall be identified by the confirmatory test as specified in IS 667.

5.2 Spun hemp yarn, untarred or tarred shall comply with the requirements specified in Table 1.

5.3 Rot Proofing Treatment

If required by the buyer, spun hemp yarn shall be rot-proofed by the application of a suitable rot-proofing agent in appropriate quantity as agreed to between the buyer and the seller. In case zinc or copper naphthenate is used, the zinc content shall be within 0.8 percent to 1.2 percent and copper content shall be within 0.4 percent to 0.8 percent respectively and the estimation of Zn and Cu shall be done in accordance with IS 3522 (Part I).

Table 1 Requirements of Spun Hemp Yarn
(Clause 5.2)

Sl No.	Variety No. (or No. of Yarns Per Ply)	Linear Density (Approx) Ktex		Turns Per Metre of Piled Yarn, <i>Min</i>	Runnage (M/25 Kg), <i>Min</i>		Breaking Load, N (60 cm Test Length), <i>Min</i>		Tar Content for Tarred Yarn	Ash Content	Water Soluble Matter Content (of Extracted Yarn)
											
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i)	1	5.6	7.5	—	4430	3323	490	400	25 percent, <i>Min</i> and 33 percent, <i>Max</i>	4 percent, <i>Max</i>	3 percent, <i>Max</i>
ii)	2	11.8	15.7	59	2123	1588	805	645			
iii)	3	18.1	24.0	46	1385	1043	1205	960			
iv)	4	24.2	32.3	39	1034	775	1605	1295			
v)	5	30.1	40.0	36	831	628	2010	1605			
	Methods of Test	IS 1315		IS 832 (Part 1)/(Part 2)	Annex B		IS 1670		Annex B	IS 199	IS 3456

NOTE — 1 N = 0.102 kgf approximately.

6 SAMPLING AND CRITERIA FOR CONFORMITY

6.1 Lot

The quantity of bundles of hemp yarn of the same variety delivered to one buyer against one dispatch note shall constitute a lot.

6.2 The conformity of a lot to the requirements of this standard shall be determined on the basis of the tests carried out on the samples selected from the lot.

6.3 Unless otherwise agreed to between the buyer and the seller, the number of bundles to be selected from a lot shall be in accordance with Table 2.

6.3.1 One skein shall be drawn from each bundle selected as in **6.3**.

6.4 Number of Tests

6.4.1 The runnage (m/25 kg) of each bundle selected shall be determined. Breaking load and turns per metre tests shall be determined on 20 test specimens prepared from the skeins selected as in **6.3.1** at random. As far as possible equal number of test specimens shall be prepared from each skein selected.

6.4.2 For determining tar content, ash content and water-soluble matter content, any two skeins shall be drawn out of the skeins selected in **6.3.1** and one sample for each requirement shall be tested from each of the skeins drawn for testing.

6.5 Criteria for Conformity

6.5.1 The lot shall be considered conforming to the requirements of this standard if the following conditions are satisfied:

- a) From the test results for turns per metre of plied yarn, runnage and breaking load, the average \bar{X} and the range R is determined, and the value of the expression $\bar{X} - 0.4 R$ is greater than or equal to the relevant specified requirement;
- b) From the test results for ash content and water-soluble matter content, the average \bar{X} and the range R is determined, and the value of the expression $\bar{X} + 0.4 R$ is less than or equal to the relevant specified requirement; and
- c) All the individual test results obtained on tar content shall remain within the specified limits.

where

\bar{X} = Average value obtained by dividing the sum of the observed values by the number of test results.

R = Range, that is difference between the maximum and minimum in a set of observed values.

7 PACKING

7.1 Unless otherwise agreed to between the buyer and the seller, the yarn shall be made into 1.8 m or 2.3 m girth skeins each weighing approximately 500 g. A suitable number of such skeins shall be packed into a bundle weighing 25 kg.

8 MARKING

8.1 Each bundle of skeins shall be marked with the following:

- a) Name of the material;
- b) Varieties of spun hemp yarn;
- c) Manufacturer's name or trade-mark, if any;
- d) Net mass of the bundle;
- e) Month and year of manufacture; and
- f) Any other information required by the law in force and/or by the buyers.

8.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

Table 2 Number of Bundles to be Selected from a Lot
(Clause 6.3)

Sl No.	Number of Bundles in the Lot	Sample Size of Bundles
(1)	(2)	(3)
i)	Up to 15	2
ii)	16 to 25	3
iii)	26 to 50	5
iv)	51 and above	8

ANNEX A*(Clause 2)***LIST OF REFERRED INDIAN STANDARDS**

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
IS 199 : 1989	Textiles — Estimation of moisture, total size or finish, ash and fatty matter in grey and finished cotton textile materials (<i>third revision</i>)	IS 1315 : 1977	Method for determination of linear density of yarns spun on cotton system (<i>first revision</i>)
IS 667 : 1981	Methods for identification of textile fibres (<i>first revision</i>)	IS 1670 : 1991	Textiles — Yarn — Determination of breaking load and elongation at break of single strand (<i>second revision</i>)
IS 832	Textiles Determination of twist in yarns:	IS 3456 : 2022	Method for determination of water-soluble matter of textile materials (<i>first revision</i>)
(Part 1) : 2021	Direct counting method (<i>third revision</i>)	IS 3522 (Part 1) : 1989	Methods for estimation of common preservatives on textiles: Part 1 (<i>first revision</i>)
(Part 2) : 2011	Untwist/Retwist method for single spun yarns (<i>second revision</i>)	IS 6359 : 2023	Method for conditioning of textiles (<i>first revision</i>)

ANNEX B
(Table 1)**METHOD FOR DETERMINATION OF RUNNAGE AND TAR CONTENT****B-1 RUNNAGE (LENGTH IN m/kg OR 25 kg)**

B-1.1 Take-off from the skein a test specimen of 10 metres length measured under a tension of 2 percent of the specified breaking load. Condition the specimen to moisture equilibrium (*see 3.1*) and determine the mass. On the basis of the result obtained, calculate the length in m/kg or 25 kg of the yarn.

B-2 TAR CONTENT

B-2.1 Cut out from each skein a test specimen weighing about 10 g. Condition the test specimen to

moisture equilibrium (*see 3.1*) and determine its mass to the nearest 25 mg. Extract the specimen in a Soxhlet apparatus with benzene as the solvent for about an hour and a half with a minimum of six syphonings. Evaporate the solvent from the extract until the odour of the solvent disappears. Dry the residue at 100 °C to 105 °C for one hour and then condition it to moisture equilibrium. The difference in mass, expressed as a percentage of the mass of the unextracted specimen, shall be taken as the tar content.

ANNEX C
(Foreword)

COMMITTEE COMPOSITION

Cordage Sectional Committee, TXD 09

<i>Organization</i>	<i>Representative(s)</i>
Indian Institute of Technology Delhi, New Delhi	DR R. CHATTOPADHYAY (<i>Chairperson</i>)
Association of Synthetic Fibre Industries, New Delhi	DR M. S. VERMA
Azuka Synthetics LLP, Panchkula	SHRI SUSHANT GUPTA SHRI DEVRAJ THAKUR (<i>Alternate</i>)
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Chhotanagpur Rope Works Private Ltd, Ranchi	SHRI SIDDHARTH JHAWAR SHRI ANURAG JHAWAR (<i>Alternate</i>)
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Indian Jute Industries Research Association, Kolkata	Ms SOUMIATA CHOWDHURY SHRI PARTH SANYAL (<i>Alternate</i>)
Indian Jute Mills Association, Kolkata	SHRI SAMIR KUMAR CHANDRA SHRI BHUDIPTA SAHA (<i>Alternate</i>)
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Oil India Ltd (OIL), Assam	REPRESENTATIVE
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Reliance Industries Ltd, Mumbai	SHRI RAJIV GUPTA SHRI KESHAV PAREEK (<i>Alternate</i>)
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Tufropes Pvt Ltd, Silvassa	SHRI ANURAG SARIN SHRI SHASHI BHUSHAN NEGI (<i>Alternate</i>)
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MEMBER SECRETARY
SHRI ASHWANI KUMAR
SCIENTIST 'B'/ASSISTANT DIRECTOR
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